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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/710,362	11/10/2000	John C. Connolly	PLW 13206	5398

28581 7590 09/11/2002

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EXAMINER

MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/710,362

Applicant(s)

CONNOLLY ET AL.

Examin r

James A. Menefee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 12-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

In response to the amendment filed 3 July 2002, claim 2 has been amended. Claims 1-23 are pending.

Election/Restrictions

This application contains claims 12-23 drawn to an invention nonelected with traverse in Paper No. 7. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

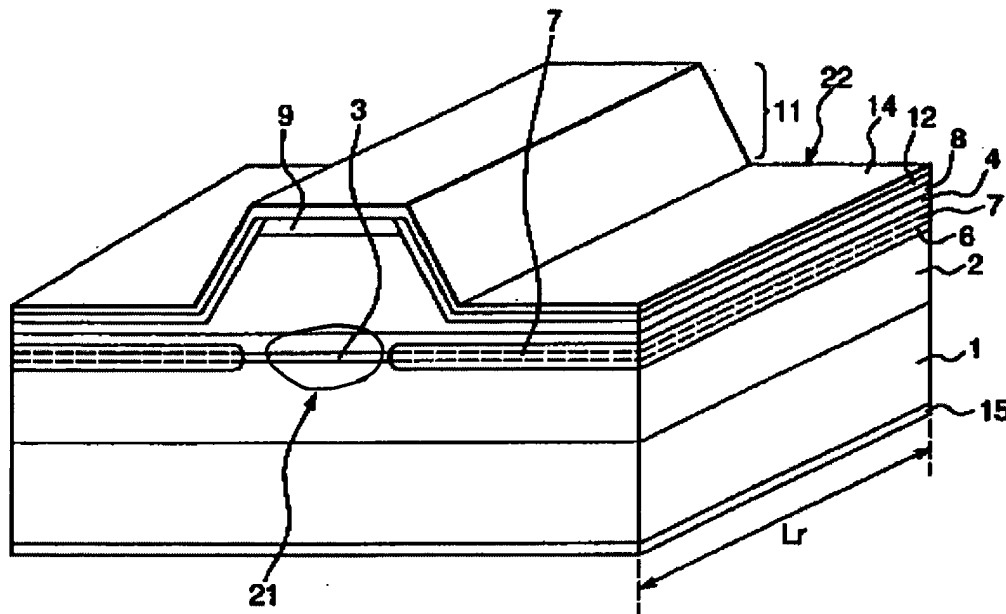
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-8 and 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagai (US 5,960,020). Nagai discloses the claimed invention as follows:

Regarding claim 1, Nagai discloses a ridge waveguide semiconductor laser diode comprising a first conductor layer 14, a second conductor layer 15 facing the first conductor layer, an active layer 3 disposed between the conductor layers, a gain region of the active layer (circled in red below), and reduced conductivity regions 7 of the active layer flanking the gain region and for impeding the passage of current (Fig. 1 and discussion thereof).

Fig. 1



Regarding claim 2, Nagai discloses that the active region is a quantum well (col. 6 line 14)

Regarding claims 3-4, Nagai discloses that the gain region supports a desired lateral mode, namely the fundamental lateral mode (col. 2 lines 32-36; col. 3 lines 10-14).

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Regarding claim 5, while Nagai does not explicitly state the material of the active layer, all of the other parts of the laser are made of materials such as AlGaAs and GaAs, therefore it is inherent that the active layer may be made of one of the claimed materials.

Regarding claim 6, it is inherent that the conductor layers provide a current through the active layer larger than the threshold current because this will necessarily happen for lasing to occur.

Regarding claim 7, it has been disclosed in the rejection of claims 3-4 above that the desired lateral modes are sustained. It is also disclosed that the amplification portion of the gain region has a smaller lateral extent than the entire gain region (abstract lines 9-13).

Regarding claim 8, Nagai discloses that the reduced conductivity regions 7 are implanted with high energy Si ions (Fig. 2B and discussion thereof).

Regarding claim 10, it is inherent that the reduced conductivity portions provide a lateral index step, because these portions will necessarily have a different refractive index than the gain region because light is being guided through the gain region.

Regarding claim 11, an insulator 12 is disposed adjacent to the first conductor layer (see Fig. 1 above).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai in view of Nagai et al (US 5,469,457). Nagai '020 discloses all of the limitations of the claims as shown above, but does not disclose the specific energy of the high energy implanted ions. Nagai '457 teaches a device where Si ions (as in Nagai '020 above) are implanted for the same reason as in Nagai '020, to produce disordered regions where little current flows. Nagai '457 teaches that these ions be implanted at an energy of 150 KeV (col. 9 lines 20-36). It would have been obvious to one skilled in the art to implant the atoms at that energy as the atoms will be sufficient for disordering the quantum wells, and so the upper cladding will not be converted to the same conductivity as the lower cladding, as taught by Nagai '457.

Response to Arguments

Applicant's arguments filed 3 July 2002 have been fully considered but they are not persuasive. Applicant's only argument is that "Nagai does not expressly or inherently describe each and every element recited in independent claim 1." Applicant argues that the disordered regions that Examiner relies upon are not reduced conductivity regions, and therefore only provide optical confinement, and not electrical confinement. The Examiner disagrees. The Examiner contends that the disordered regions will inherently be of a reduced conductivity and will impede the passage of current. The Examiner provides Beyea et al. (US 6,055,2580 in support of this argument. Beyea discusses ion implantation into an active region, and further says that the ions may be Si, like those in Nagai (col. 5 lines 29-52; col. 9 lines 7-8). Beyea further states "ion implantation reduces the conductive characteristic of the affected regions."

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Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
August 23, 2002


PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800